ODONATOLOGICAL ABSTRACTS

(65) AAGAARD, K. & D. DOLMEN, 1971. Contribution to the knowledge of the Odonata of Tröndelag. Norsk ent. Tidsskr. 18: 99-101. – *(Royal Norwegian Acad. Sci., Museum, Erling Skakkes 47 b, Univ. Trondheim, NO-7000 Trondheim).*

A list of 14 spp. collected between 1964-1970 in the counties of Tröndelag, Norway, is given. Lestes sponsa, Coenagrion pulchellum and Sympetrum flaveolum were not previously reported from the region.

(66) BALLAN-DUFRANCAIS, C., A.-Y. JEANTET & R. MARTOJA, 1971. Composition ionique et signification physiologique des accumulations minérales de l'intestin moyen des Insectes. C.R. Acad. Sci. Paris (D) 273 (2): 173-176. – *(Lab. Histophysiol. Insectes, Univ. Paris-VI, 12 rue Cuvier, F-75 Paris Ve).*

The chemical composition of the sphaerocrystals from the midgut of representatives of 9 orders, including a not further identified Gomphus larva, was determined. In the latter Ca, Mg, Mn and Fe were found. The midgut sphaerocrystals are not identical with those found in the Malpighian tubules.

(67) BEI-BIENKO, G.G., 1971. Nekotorye itogi issledovanii 1945-1970 gg. po faune i sistematike nasekomyh evropeiskoi chasti SSSR i zapadnyh ee territorii. (Some aspects of the 1945-1970 research on the fauna and systematics of insects of the European part of the USSR and its western territories). Bull. ent. Pol. 41 (4): 867-878. (Russian, with Polish s.). – *(Zool. Inst., Acad. Sci. USSR, Leningrad).*

In a tabular review of the number of spp. recorded or expected in various republics and provinces of the European USSR, the following figures are given for Odon.: Estonia 53, Latvia 53, Lithuania 52, Ukraine 30. In all, about 100 spp. of Odon. are expected to occur in the European part of the USSR. No data are available for the Leningrad district, Belorussia and Moldavia..

(68) BENASSO, G., 1971. Note sulla etologia della riproduzione negli artropodi con particolare riguardo agli insetti. Circolo Naturalistico Friulano, Udine, 2, 23 pp – *("Al Pezzuzo", I-34019 Sistiana 12 M, Trieste).*

A general review of behavioural patterns involved in the process of reproduction of various insect orders is given. Courtship display in Odon. is briefly described.

(69) BUCHHOLTZ, C., 1971. Aeschna cyanea (Aeschnidae). Beutefang der Larven. Encyclop. Cinematogr. Göttingen (E) 1605: 1-9. – *(Fachbereich Biologie, Philipps Univ., Katzerbach 63, D-355 Marburg/Lahn, GFR).*

Explanatory text for film No. E 1605/1971 (silent, black-and-white, 16 mm, 5 1/2 min). The larva of A. c. catches its prey by a sudden thrust forward of its mask. Beforehand it usually orients itself into the right position. Thrusting of the mask can be done as a purely hereditary coordination or simultaneously with taxism. In both cases the acts of capture show 5 phases of movement related chronologically to each other. (Author).

(70) DABORN, G.R., 1971. Survival and mortality of coenagrionid nymphs (Odonata: Zygoptera) from the ice of an aestival pond. Can. J. Zool. 49: 569-571. – *(Dept. Zool.*

Univ. Alberta, Edmonton, CA).

Live nymphs of Coenagrion angulatum (Walker), C. resolutum (Hagen) and Enallagma boreale Selys, were recovered from the ice of an aestival pond nr. Edmonton, Alberta, Canada. The percentage of such nymphs surviving decreased progressively throughout the winter, but some remained viable by the time of the spring thaw. It is suggested that the level of mortality was unusually high as a result of lower than normal temperatures in the ice. (Author).

(71) DUMONT, H.J. & H. GYSELS, 1971. Étude faunistique et écologique sur les criques de la Flandre orientale et le long de l'Escaut. Considérations sur leur chimisme, leur faune planktonique, entomologique et malacologique et discussion de leur état biologique actuel. Annls Soc. r. zool. Belg. 101 (3): 157-181, 5 tabs. – (*Inst. Zool., Univ. Gent, Ledeganckstr. 35, B-9000 Gent*).

Analysis of ecological conditions of the creeks in East Flanders, Belgium, and considerations on their fauna are given. In general the water is oligohaline, well-buffered and very productive for planctonic and other life. In the tabular review of the recorded fauna 15 odon. spp. are listed.

(72) FERNET, L. & J.G. PILON, 1971. Données sur l'émergence de certaines espèces d'Odonates de la région du Cap Jaseux, Saguenay. Ann. sec. Ent. 16 (3): 102-111. – (*Collège de Joliette, CEGEP, Joliette, P.Q., CA*).

Preliminary data on the emergence of Enallagma boreale, E. hageni, E. vernale, Libellula exusta julia, Leucorrhinia proxima and Lanthus parvulus in the Saguenay region, Quebec, Canada, show that these spp. have a synchronous pattern of emergence. Lestes disjunctus, Aeshna umbrosa, Sympetrum danae and S. costiferum, on the other hand, exhibit an extended pattern.

(73) GILLASPY, J.E., 1971. A spectacular case of termite predation by dragonflies. Taius 4 (1): 87-88. – (*Dept. Biol., Texas A & I Univ., Kingsville, Texas 78363, USA*).

A large number of Anax junius and other unidentified libelluline species were observed feeding on swarming termites, Reticulotermes flavipes (Kollar), on October 14, 1968.

(74) HINNEKINT, B., 1971. De Belgisch faunistische cartografie ook van de grond voor wat betreft de Odonata. (The mapping of the Belgian odonate fauna). Kontakt, Aalst 19 (74): 40-41. (Dutch). – (*Rodenbachstraat 29, B-9470 Denderleeuw*).

The regional odonatological meeting held in Utrecht, Netherlands, on November 21, 1970, has decided that the faunistic mapping of Odon. in Belgium, W. Germany and the Netherlands should be carried out in the frame work of the European Invertebrate Survey. At the initial stage the fauna should be inventarized per municipality. Coordinators for Belgium are Dr. H. Dumont (Inst. Zool., Univ. Gent) and the author.

(75) HUNG, A.C.F., 1971. Cytological studies of five species of dragonflies (Odonata: Anisoptera). Ent. News 82: 103-106. – (*Dept. Biol., Univ. N. Dakota, Grand Forks, N.D. 58201, USA*).

Brief cytotaxonomic notes are given on 5 N. American spp. that were previously either not studied cytologically or for which different chromosome numbers were reported: Aeshna clepsydra Say (Grand Forks, N.D.; n = 14, m present). A. verticalis Hagen (Grand Forks, N.D.; n = 14, m hardly recognizable), Epicordulia princeps (Hagen) (Lake Itasca, Minn.; n = 12, m present, XO), Tetragoneuria spinigera (Selys) (Lake Itasca, Minn.; n = 14, no m), Erythrodiplax berenice (Drury) (Grand Forks, N.D.; n = 14, m present). Micrographs of all spp. are added (950-2150 X).

(76) ISHIDA, S., 1971. (Report of the Sixth Tombo Expedition to the Ryû-kyû Islands). Bull. Naka-Nippon Tombo Group, No. 24: 1-17. (Japanese). – (*2-8, Okinoshima-cho, Yokhaichi-shi, Mie Pref., JA*).

Diary of an odonatological collecting trip to the islands Okinawa, Ishigaki-jima, Iriomote-jima and Yonakuni-jima, from May 20 to June 6, 1970.

(77) JACZEWSKI, T. & M. MROCZKOWSKI, 1971. Achievements of systematic entomology in Poland. Bull. ent. Pol. 41 (4): 723-732. (Polish, with Engl. s.). – (*Inst.*

Zool., Univ. Warsaw, Krakowskie Przedmieście 26-28, Warszawa, PO).
After the foundation of the Pol. Ent. Soc., in 1920, the Odon. were among the 11 orders studied systematically in Poland until World War II. Reference is made to the contributions by J. Fudakowski, S.M. Sumiński and J. Zaćwilichowski. Their work has been continued by other workers in the period 1945-1970.

(78) KANIA, C., 1971. Achievements of entomology in Lower Silesia in 1945-1970. Bull. ent. Pol. 41 (4): 855-865. (Polish, with Engl. s.). – *(Zespól Entomologii, Inst. Plant Protection, ul. Cybulskiego 32, Wroclaw, PO).*
Odonatology has not been the strongest point in the entomological achievements in Lower Silesia, Poland, during the postwar period. Reference is made to the faunistic contributions by S. Mielewczyk, Z. Hajduk and J. Niedzielski.

(79) KEPKA, O., 1971. Die Fauna der Steiermark. In: Hasiba & Sutter, Die Steiermark: Land, Leute, Leistung. Styria, Graz, pp. 153-190. – *(Zool. Inst., Univ. Graz, Universitätsplatz 2, A-8010 Graz).*
On pp. 160-161 a review is given of the vertical distribution of Odon. in Styria, Austria. In all, 26 taxa are considered. Platycnemididae, Lestidae and Calopterygidae are treated on the family level, while Coenagrionidae, Gomphidae, Aeshnidae, Cordulegasteridae, Corduliidae and Libellulidae are dealt with on the genus or, in most cases, on the species level. The altitude zones considered are: (1) deciduous and mixed forest (300-500 m above sea level, 22 taxa), (2) Fagetum (500-1000 m, 9 taxa), (3) Piceetum (1000-1500 m, 9 taxa), (4) "alpine zone" (1500-3000 m, 6 taxa). Climatological chacracters of each zone are described in detail.

(80) MANLEY, T.R., 1971. Dragonfly attacks Limenitis defending its territory. J. Lepid. Soc. 25: 146-147. – *(Bloomsburg State Coll., Bloomsburg, Pa., USA).*
A not identified dragonfly was observed to attack a specimen of L. archippus floridensis Strecker (Lepidoptera, Nymphalidae), which had entered its territory and to pursue it as it attempted to escape. The question of whether this is an example of interspecific territorial behaviour or of predation is raised.

(81) MARTOJA, R., 1971. Données préliminaires sur les accumulations de sels minéraux et de déchets du catabolisme dans quelques organes d'Arthropodes. C.R. Acad. Sc. Paris (D) 273: 368-371. – *(Lab. Histophysiol. Insectes, Univ. Paris-VI, 12 rue Cuvier, F-75 Paris Ve).*
Preliminary studies have been made on various arthropods, including a not further identified Gomphus sp., using various techniques to determine accumulation of mineral salts and catabolic wastes in various organs. The organs were fixed in Carnoy, and the mineral salts localized by the method of von Kossa. Uric acid was demonstrated by cytochemical techniques and by paper chromatography, guanine cytochemically, with trial extraction with iron alum. Normal sections and those treated with uric acid solvents, guanine solvents or demineralizing agents were compared spectroscopically.

(82) MIELEWCZYK, S., 1971. Libellen (Odonata) der Halbinsel Hel. Bull. ent. Pol. 41 (2): 361-369. (Polish, with German s.). – *(Inst. Zool., P.A.N., ul. Swierczewskiego 19, Poznan, PO).*
Material collected in 1967-1969 on the peninsula of Hel, Poland, is listed and a review is given of earlier literature records. The local fauna list is increased from 16 to 28 spp. Several spp. are new for the Polish Eastsea coast. In view of the small territory, the fauna is considered rich, but it is feared that the increased swamp succession will have a negative influence on its status.

(83) MILL, P.J. & D.A. LOWE, 1971. Ultrastructure of the respiratory and non-respiratory dorso-ventral muscles of the larva of a dragonfly. J. Insect Physiol. 17: 1947-1960. – *(Dept. Zool., Univ. Leeds, Leeds, LS2 9JT, UK).*
Late instar larvae of Anax imperator were used. The respiratory and non-respiratory dorso-ventral muscles of the dragonfly larva

have certain features in common. Nevertheless, they differ in a number of ways. Thus the respiratory muscle is heavily tracheated and has 9 to 10 actins surrounding each myosin filament, a poorly developed sarcoplasmic reticulum, numerous mitochondria regularly arranged on each side of the Z lines and abundant glycogen. On the other hand the non-respiratory muscle has 10 to 12 actin filaments in each array, both tubular systems are well developed, there are fewer mitochondria and glycogen is less abundant. The significance of these differences and a possible scheme for classifying insect muscles are discussed. (Author).

(84) MIYAKAWA, K., 1971. Life-history of Somatochlora viridiaenea viridiaenea Uhler with notes on nymphs of S. viridiaenea atrovirens Selys (Odonata, Corduliinae). Bull. Sugadaira Biol. Lab. 4: 31-46. (Jap. with Engl. s.). – *(Imafuku 1024, Kawagoe, 356, JA).*

The life hist. of S. v. viridiaenea is described on the basis of material reared under laboratory conditions. Special attention is payed to external morphology and rate of development. Comparative notes on the young stages of S. v. atrovirens are added. In both spp. there are 12 instars. Structural characters are figured and tabulated, but no significant differences are found between the two ssp. In S. v. viridiaenea hatching frequencies show a bimodal pattern. The larvae are not negatively phototactic. Both univoltine and semivoltine larvae were obtained from an egg batch deposited by a single ♀. No correlation was found between the duration of the embryonic period and that of the larval life.

(85) MOLLER-PILLOT, H.K.M., 1971. The assessment of pollution in lowland streams by means of macrofauna. Pillot-Standaardboekhandel, Tilburg (Netherlands). 286 pp., 1 map, 96 tabs. (Dutch, with Engl. s.). – *(Leyparkweg 37, Tilburg, NL).*

The author examines the possibilities of assessing the water quality in lowland streams by means of the macrofauna present. It is based on studies carried out during 1964-1966 in the drainage area of the river Dommel, Netherlands. Larvae of the following odon. ssp. were recorded and their ecological values with respect to water quality were discussed: Pyrrhosoma nymphula, Ischnura elegans, Lestes viridis, Calopteryx splendens, C. virgo and Aeshna spp. Five faunal groups, characteristic for different degrees of pollution were identified; in the direction of decreasing pollution these are: "Eristalis", "Chironomus", "Hirudinea", "Gammarus" (all Odon. except Calopteryx) and "Calopteryx". The fauna characterised as "Calopteryx" group is most sensitive to pollution.

(86) MONTGOMERY, E.B., 1971. Records and observations of Indiana Odonata. Proc. Indiana Acad. Sci. 80: 253-263. – *(906 North Chauncey Ave., West Lafayette, Indiana 47907, USA).*

A historical review of odonatology in Indiana is traced from 1834 to the present. The odon. fauna for the State consists of 148 spp. now including Sympetrum costiferum reported for the first time. A brief presentation of larval development is given for Ischnura verticalis, Holotania luctuosa, and Erythemis simplicicollis.

(87) MOUZE, M., 1971. Rôle de l'hormone juvénile dans la métamorphose oculaire de larves d'Aeschna cyanea Müll. (Insecte Odonate). C.R. Acad. Sc. Paris (D) 273: 2316-2319, 2 pls. – *(Lab. Biol. anim., SN 3, Univ. Sci. Techn. Lille-I, B.P. 36, F-59 Villeneuve d'Ascq).*

Growth and metamorphosis of the visual apparatus are virtually ecdysone independent. They appear to be essentially controlled by the level of juvenile hormone, as was shown by experiments in which the methylic ester of farnesol was used as a mimetic of the hormone.

(88) MOUZE, M., 1971. Etude expérimentale des facteurs morphogénétiques et hormonaux réglant la croissance oculaire des insectes odonates. Thesis, Univ. Sci. et Techn. Lille, 103 pp, 32 pls. – *(Lab. Biol. anim., SN 3, Univ. Sci. Techn. Lille-I, B.P. 36, F-59 Villeneuve d'Ascq).*

The postembryonic growth of the visual apparatus in Odon. is analyzed step by step from hatching onwards. During metamorphosis profound changes occur. Adult eyes are shaped on an internal cuticular mould and at the expense of embryonic structures that have assured the growth of the eyes and optic lobes. Surgical experiments have shown that interactions exist between eye and optic lobe during growth. The eye develops autonomously. The optic lobe is likewise autonomous, but subject to the differentiatory and regulatory influences of the post retinal fibres. The mitotic and differentiatory activities of ocular growth zone and optic lobe are ecdysone independent and subject to the action of juvenile hormone. Experiments on hormonal control throw a new light on the mode of action of these hormones.

(89) MOUZE, M. & F. SCHALLER, 1971. Métamorphose oculaire de larves d'Aeschna cyanea Müll. (Insecte, Odonate) privées d'ecdysone. C.R. Acad. Sc. Paris (D) 273: 2122-2125, 1 pl. – (*Lab. Biol. anim., SN 3, Univ. Sci. Techn. Lille-I, B.P. 36, F-59 Villeneuve d'Ascq*).
The mitotic and differentiatory activities of structures responsible for growth and metamorphosis of the eyes and optic lobes are unaffected in larvae in which the molting cycle is blocked by ablation of the ventral glands. This exdysone independency may be related to the characteristic growth pattern of each of these organs.

(90) NARAOKA, K., 1971. (Body size of Aciagrion hisopa Selys). The nature and Insects 6 (3): 21-22. (Japanese). – (*Fukutsuru-so. 5-10 Shintomo-cho, Kushiro-shi, Hokkaido, JA*).
A significant difference in body size was recognized between summer and hibernating generations.

(91) ODONATA. BULLETIN OF NAKA-NIPPON TOMBO GROUP. No. 24 (August, 1971). (Japanese). – (*c/o Mr. I. Matsui, Aza Ichiba, Moriyama, Moriyama-ku, Nagoya, JA*)
Ishida, S.: Report of the Sixth Tombo Expedition to the Ryû-kyû Islands. (For address of the author cf. *OA*, No. 76).

(92) O'FARRELL, A.F., 1971. Roosting and related activities in some Australian Zygoptera. J. Ent. (A) 46: 79-87. – (*Dept. Zool., Univ. New England, Armidale, N.S.W. 2351, AU*).
Perching, roosting and early morning activities in Austrolestes annulosus, A. leda (Sympecmatidae) and Ischnura heterosticta (Coenagrionidae) are described and discussed in relation to the general biology of these insects, especially their capacity for physiological colour change. (Author).

(93) O'FARRELL, A.F., 1971. Physiological colour change and its significance in the biology of some Australian Odonata. Proc. XIII Int. Congr. Ent. (Moscow 1968) 1: 534. – (*Dept. Zool., Univ. New England, Armidale, N.S.W. 2351, AU*).
Autonomous epidermal cells, responding to environmental stimuli, produce reversible colour changes, assisting thermoregulation, in Diphlebia tillyardi, but in Austrolestes annulosus, lacking epidermal autonomy, an "abdominal centre" apparently regulates colour change. Colour change in other Odon., its absence in tropical spp., and its relationships to development, behaviour, ecology and distribution are briefly discussed. (Author, In: Abstracts of Papers, Moscow 1968, pp. 185-186).

(94) OKOROKOV, V.I. & A.I. HARITONOV, 1971. Fauna i biologia strekoz na Iuzhnom Urale i ih rol'kak promezhutochnyh hoziaev gel'mintov. (Fauna and biology of the Southern Ural dragonflies, and their role as transitional hosts of helminths). Vopr. zool., Cheliabinsk 1971 (2): 32-40. (Russian). – (*State Inst. Pedagogics, Cheliabinsk, USSR*).
The 33 spp. recorded from the Southern Ural, U.S.S.R., are analyzed from the points of view of habitat selection, seasonal dynamics and phenology. The economic (food of fish and birds) and veterinary (hosts of helminths parasitizing in domestic and wild birds) importance of dragonflies is stressed.

(95) OKUMURA, T., 1971. On two small collections of the Odonata from continental China. Tombo 14 (1-2): 12. – (*2-21-11,*

Nakamachi, Meguro-ku, Tokyo, JA).
A list is given of 4 spp. from Inner Mongolia and 11 from Shansi Prov., N. China.

(96) OOSTERWAAL, L. & J. MUILWIJK, 1971. Het libellenonderzoek op het Oppad. (Dragonfly observations at the Oppad). Triëntalis 23 (1): 3-9. (Dutch). – (*Uilenstede 4, K-2, Amstelveen, NL*).
The observations on the seasonal distribution, behaviour and ecology of a dragonfly faunula (21 spp.) near the village of Kortenhoef, Netherlands, carried out from May to Oct., 1970, are summarized. A more detailed account is given for Lestes sponsa. In this sp. adult life appears to last up to four weeks, as has been ascertained by capture-mark-recapture.

(97) PARISI, V., P. CHIERICI MAGNETTI, M. DOTTI, M. MICHELANGELI, A. PAOLETTI DI CHIARA, F. ROMAGNOLI JOPPI, E. SMEDILE, E. TIRALDI & A. ZULLINI, 1971. Studio delle biocenosi lotiche del Po a Trino Vercellese negli anni 1967-1968. Ist. Lombardo (Rend. Sc.) (B) 105: 3-56. – (*Ist. Zool., Univ. Parma, Via Università 12, I-43100 Parma*).
In the course of the biocenotic survey of the Po River, carried out during 1967-1968 at Trino Varcellese, Italy, 88 spp. were identified in the zoocenosis, among them 4 Zygoptera and 4 Anisoptera, 3 of the latter in the adult stage only. Odonate faunas of different niches are clearly distinct.

(98) PARR, M.J., 1971. Comparative studies of coenagriid (Odonata) population ecology. Proc. XIIIth Int. Congr. Ent. (Moscow) 1: 540-541. – (*Dept. Biol. Sci., Ahmadu Bello Univ., Zaria, Nigeria*).
The interspecific ecological relationships of Ischnura elegans, Coenagrion puella and Enallagma cyathigerum were studied in 3 habitats in N. England. Capture-mark-recapture of I. elegans has shown significant differences of ecology and behaviour associated with habitat types in neighbouring subcolonies. This sp. shows several ecobehavioural peculiarities compared with other Zygoptera. (Author, In: Abstracts of Papers, Moscow 1968, p. 190).

(99) PARR, M.J. & M. PALMER, 1971. The sex ratios, mating frequencies and mating expectancies of three coenagrionids (Odonata: Zygoptera) in Northern England. Ent. scand. 2: 191-204. – (*Dept. Biol. Sci., Ahmadu Bello Univ., Zaria, Nigeria*).
Populations of Ischnura elegans, Coenagrion puella and Enallagma cyathigerum were studied. As the true imaginal sex ratio is unknown in these spp., attempts were also made to determine the larval and final instar exuvial sex ratios. The larvae of I. elegans showed a small but unsignificant excess of ♂, and ♂ constituted 62% of imaginal samples. Larval samples of C. puella indicated a significant excess of ♂, and these constituted 76% of imaginal samples. Samples of final instar exuviae of E. cyathigerum showed that the sex ratio at emergence was exactly unity, but ♂ imagines constituted 84% of the population samples. Only 5% ♂ and 12% ♀ of I. elegans were seen to mate, despite a high persistence at water and a long copulation time. Sexual maturation in this sp. is rapid and both sexes mate well into old age. The mating frequencies in the other 2 spp. were low, but their ♀ showed much higher values than those of I. elegans. The data suggest that some ♂ of I. elegans and E. cyathigerum are not successful in achieving mating. (Author).

(100) PAULSON, D.R. & C.E. JENNER, 1971. Population structure in overwintering larval Odonata in North Carolina in relation to adult flight season. Ecology 52 (1): 96-107. – (*Dept. Zool., Univ. North Carolina, Chapel Hill, N.C. 27514, USA*).
The hypothesis that North Temperate Odon. can be categorized into "spring" or "summer" spp. by the predominant overwintering instars and the position and duration of the adult flight season was tested for 55 spp. in N. Carolina, USA. Over 3,000 larvae, collected at a time of stable instar distribution (winter), were examined and the population structure determined for each sp. The composition of the wintering populations varied from a single instar to (probably) the entire spread of instars known for the sp. The peak occurred in any one of the last four instars,

depending upon the sp. The spring vs. summer sp. classification is valid at high latitudes but breaks down at the latitude of North Carolina, where there is a continuum of variance from one type of life history to another. (Authors).

(101) PFAU, H.K., 1971. Struktur und Funktion des sekundären Kopulations-apparates der Odonaten (Insecta, Palaeoptera), ihre Wandlung in der Stammesgeschichte und Bedeutung für die adaptive Entfaltung der Ordnung. Z. Morph. Tiere 70: 281-371. – (*Zool. Inst., Univ. Saarlanden, D-66 Saarbrücken, GFR*).

Three non-homologous structures act as intromittent organs: ligula (Zygoptera), hamuli posteriores (Anisozygoptera) and vesica sperminalis (Anisoptera). Ligula and vesica sperminalis are anchored by means of hydraulically working "gland"-structures, Ligula-Schwellkörper and Vesicula sperminalis-Schwelkörper respectively. A sperm-pump (Ausspritzkammer) extends the function of vesica sperminalis-Schwellkörper in non-aeshnoid Anisoptera, a group found to be monophyletic. The study includes a depiction of the peripheral abdominal nerves of larva and imago. (Author).

(102) PINHEY, E., 1971. Notes on the genus Pseudagrion Selys (Odonata: Coenagrionidae). Arnoldia (Rhodesia 5 (6) 1-4. – (*National Mus., P.O.B. 240, Bulawayo, Rhodesia*).

P. estesi sp. n. from the Zwimbango R., Angola, is described and illustrated. It shows similarities with P. angolense Sel. and P. hageni Karsch. P. isidromorai Sart is synonymized with P. glaucoideum Ris; its ♂ anal appendages and prophallus and the ♀ mid--thorax are figured.

(103) PINHEY, E., 1971. A new zygopteran genus (Odonata) from Malawi. Arnoldia (Rhodesia) 5 (9): 1-5. – (*National Mus., P.O.B. 240, Bulawayo, Rhodesia*).

Oreocnemis phoenix gen. n, sp. n. (Platycnemididae) from the Mt. Mlanje is described and illustrated. The genus appears closest to Leptocnemis Sel. of the Seychelle Islands. A brief note on the biology is added.

(104) PINHEY, E., 1971. Odonata collected in République Centre-Africaine by R. Pujol. Arnoldia (Rhodesia) 5 (18): 1-16. – (*National Mus., P.O.B. 240, Bulawayo, Rhodesia*).

An account is given on a collection of 51 spp. collected between 1965-1969 in the neighbourhood of Bangai. Nesciothemis pujoli sp. n. and hitherto unknown ♀ of Elattoneura nigra Kimmins are described and illustrated. Some information is supplied on the genera Sapho Selys, and Nesciothemis Longfield. It is found that S. superba Sjöstedt is only a form of S. bicolor Selys, while Limnetothemis Pinhey is placed in synonymy with Nesciothemis. Little known species in the collection include Orthetrum latihami Pinhey and Trithemis fumosa Pinhey. For all species listed notes on the general distribution are added.

(105) PINHEY, E., 1971. Odonata of Fernando Po island and of neighbouring Cameroons territory. J. ent. Soc. sth. Afr. 34 (2): 215-229, 1 pl. (col.). – (*National Mus., P.O.B. 240, Bulawayo, Rhodesia*).

23 spp. from Fernando Po and 6 from the neighbouring mainland are reviewed. Of the former, 3 spp. and 1 ssp. are confined to the island. A new sp., Enallagma buchholzi, and a new ssp., Chlorocypha cancellata insulana, are described and illustrated. The status of Umma splendida Navás is discussed, and it is suggested that a rediscription from the types may show close affinity to U. mesostigma (Selys). Some synonymy is indicated under the spp. Elattoneura pruinosa (Selys) and Africocypha lacuselephantum (Karsch). The latter exhibits remarkable polychroism. (Author).

(106) PRITCHARD, G., 1971. Argia vivida Hagen (Odonata: Coenagrionidae) in Hot Pools at Banff. Can. Fld. Nat. 85 (2): 187-188. – (*Dept. Biol., Univ. Calgary, Calgary-44, Alberta, CA*).

The larvae of A. vivida have been found in thermal pools at 26°C in Banff, Alberta, Canada. The genus is mainly neotropical in distribution and has been recorded from hot springs in the USA. A. vivida, however, is previously recorded only from cold spring-fed streams. It appears to be a "summer species" at Banff and it is suspected that photoperiod is important in the seasonal regulation of its life history. (Author).

(107) PRITYKINA, L.N., 1971. The new dragonflies from the Jurassic of Karatau and their systematic position. Proc. XIIIth Int. Congr. Ent. (Moscow) 1: 284. – *(Inst. Paleontol., Acad Sci. USSR, Leninski prospect 33, Moscow V-71, USSR)*.
Approximately 100 specimens of Odon. were recovered from the Jurassic beds at Mikhailovka, Kazakhstan, USSR, representing 29 spp., 21 genera and 14 families of the suborders Protozygoptera, Zygoptera, Anisozygoptera and Anisoptera. Among these, 25 spp., 16 genera and 5 families are new. The Karatau fauna essentially differs from the jurassic odon. faunas of western Europe and Central Asia. (For the taxonomic description of the material, by the same author, cf. B.B. Rodendorf [Ed.], 1968. Iurskie nasekomye Karatau. [Jurassic insects of Karatau]. Nauka, Moscow, 253 pp., 25 pls. [Russian]).

(108) RICHARD, G., 1971. Contribution à l'étude du système nerveux abdominal de divers insectes. Proc. XIIIth Int. Congr. Ent. (Moscow) 1: 290. – *(Lab. d'Ethol., Fac. Sci., Univ. Rennes, Av. Général Leclerc, Rennes-Beaulieu, 35, F)*.
The structure of abdominal ganglia and the innervation of various abdominal organs in 8 spp. of cockroaches, crickets, Neuroptera and Odon. (Aeshna cyanea) are compared.

(109) RJAZANOVA, G.I., 1971. Funkcional'noe znachenie formy kryl'ev u strekoz (Functional significance of dragonfly wing shape). Proc. XIIIth Int. Congr. Ent. (Moscow) 1: 293-294. (Russian). – *(Dept. Ent., Fac. Biol., Univ. Moscow, Moscow V-234, USSR)*.
The flight of 14 spp. of the families Coenagrionidae, Lestidae, Calopterygidae and of the suborder Anisoptera was studied, under natural conditions with the cine-camera (24 and 48 frames/sec). There is a relation between wing basis and body axis, wing size, beat frequency and character of flight.

(110) SATO, Y., 1971. (Life history of Sympetrum frequens). Shobo, Tokyo, 54 pp. (Japanese). – *(3-17-16, Narita-nishi, Suginami-ku, Tokyo, JA)*.
A book for children in the age of 7-10 years. Didactically organized text is illustrated by a few black-and-white and numerous colour illustrations (mostly photographs) of outstanding quality. The dragonfly life (S. frequens and S. darwinianum) is followed along the following topics: egg, hatching and prolarva, larva, emergence, maiden flight and migration, perching (S. risi), some causes of death by predation, mating, and oviposition types (Anax parthenope, Calopteryx cornelia, C. atrata, Orthetrum triangulare, Copera annulata).

(111) SCHMIDT, E., 1971. Ökologische Analyse der Odonatenfauna eines ostholsteinischen Wiesenbaches. Ein Beitrag zur Erforschung kulturbedingter Biotope. Faun-Ökol. Mitt. 4: 48-65. – *(Biol. Seminar, Pädagogische Hochschule, Mürwikerstr. 77, D-239 Flensburg, GFR)*.
The odon. fauna (28 spp.) of a little lowland pasture stream near Kiel, Germany is discussed from the point of view of phenology, biotic and abiotic factors, and nature conservation. An ecological and zoogeographical analysis of the spp. recorded is also given.

(112) SCHMIDT, E., 1971. Zur Methodik von Insektenbestimmungen in der Schule. Mathem. u. naturwiss. Unterricht, Frankfurt/M 24 (1): 16-25. – *(Biol. Seminar, Pädagogische Hochschule, Mürwikerstr. 77, D-239 Flensburg, GFR)*.
An account is given on the methods of preparation of entomological collections for the purposes of secondary (high) school education, on the arrangement of collections and on the process of identification. In all sections, special reference is made to dragonflies.

(113) SCHMIDT, E. & W. TISCHLER, 1971. Odonata, Libellen. In: P. Brohmer, Fauna von Deutschland. 11 Aufl., pp. 141-145. – *(Biol. Seminar, Pädagogische Hochschule, Mürwikerstr. 77, D-239, Flensburg, GFR)*.
A key to the suborders, families and genera of Odon. occurring in Germany, with brief characterization of spp.

(114) SCHWARZBERG, H., 1971. Ein Beitrag zur Entwicklung der Odonatenfauna des Faulen Sees bei Wanzleben (Bezirk Magdeburg). Dtsch. Ent. Z. (N.F.) 18 (4-5): 383-385. – (*Physiol. Inst., Medizinische Akademie, Leipziger Str. 44, DDR-301 Magdeburg, GDR*).

An analysis is given of changes in the odon. fauna of the lake "Fauler See" nr. Magdeburg, GDR, as observed between the years 1963-1964 and 1969. In all, 29 spp. were recorded.

(115) SCUDDER, G.G.E., 1971. Comparative morphology of insect genitalia. Ann Rev. Ent. 16: 379-406. – (*Dept. Zool., Univ. British Columbia, Vancouver, B.C., Canada*).

A review of comparative morphology of insect genitalia, analysing the homologies and functional aspects. It includes a few references to the genitalia, copulation and mating in Odon. In a tabular analysis of the parts of the ovipositor as reported in various taxa, the Odon. are also included, having 1st gonapophysis, 1st gonocoxa, 1st gonostylus, 2nd gonapophysis, 2nd gonocoxa, gonoplac, gonangulum and 2nd gonostylus.

(116) SELYSIA. Newsletter of Odonatology. Vol. 5, No. 2 (Nov. 1, 1971) (*c/o Dr. M.J. Westfall, Jr., Dept. Zool., Univ. Florida, Gainesville, Fla. 32601, USA*).

Watson, J.A.L.: The Australian national insect collection, Canberra, Australia. Odonata; – *Gloyd, L.K.*: Let's be precise in our description of species; – *Gloyd, L.K.*: Some often repeated misspellings of names for American Odonata; – *Bibliography* of the Odonata (for 1970); – Miscellaneous news on current work and informative communications.

(117) SMITH, D.S. & H.C. ALDRICH, 1971. Membrane systems of freeze-etched striated muscle. Tissue and Cell 3 (2): 261-281. – (*Lab. Cellular Biol., School of Medicine, Univ. Miami, 1155 N.W. 14th Street, Miami, Fla. 33136, USA*).

The organization of flight muscle of Celithemis eponina, with special reference to the fibre membrane systems, has been investigated by means of platinum-carbon replicas of freeze-etched material. The fracturated surface plasma membrane and origin of transverse tubules are described together with the radial course of the tubules into the cell, along grooves in the mitochondrial surface. The form of the sarcoplasmic reticulum cisternae is also described. Replicas are interpreted as revealing up to three unfractured membrane surfaces and several fractured profiles. The illustrations include stereomicrographs of replicas. (Authors).

(118) SMITS, E., 1971. Tjapung=Kindjeng=Papatong. Tong-Tong ('s-Gravenhage) 15 (23): 9. (Dutch). (*c/o T. Robinson, Pr. Mauritslaan 36, Den Haag, NL*).

A note on dragonfly folk names in Indonesia.

(119) SONEHARA, I., 1971. Early instar larvae of Aeschna juncea. Tombo 14 (1-2): 13. (Japanese, with Engl. s.). – (*Tazawa 5035, Toyoshima-machi, Minami-azumi, Nagano Pref., JA*).

The sp. treated is A. mixta Latr. and not A. juncea (L.) as stated, due to a printer's error, in the title. In the Japanese material reared from eggs, a longitudinal pale stripe is seen on abdominal segments 1-7, during instars 2-4. It is somewhat expanded on segments 1, 2, 6 and 7. The stripe turns darker in subsequent instars.

(120) SPECTRUM DIEREN ENCYCLOPEDIE, 1971. Libel. (Dragonfly). Spectrum Dieren Encyclopedie 4 (51): 1215-1219. (Dutch). – (*Podium N.V., P.O. Box 23, De Meern, NL*).

A popular account on dragonflies (Anisoptera), by an anonymous author, in the well known series. The text is accompanied by several colour photographs of Aeshnidae and Libellulidae.

(121) SPURIS, Z.D., 1971. Zametki o rasprostranenii strekoz v iuzhnoi Litve. (Contribution to the knowledge of the distribution of dragonflies in Southern Latvia). Latv. Ent. 13: 27-34. (Russian). – (*Inst. Biol., Latvian Acad. Sci., Meistaru iela 10, 226 Riga Centrs, USSR*).

During 1967-1968 dragonflies were collected at 20 localities in Southern Latvia, U.S.S.R. In all, 35 spp. were found. Among these, Coenagrion armatum (Charp.) is new to the Latvian fauna.

(122) STARK, W., 1971. Faunistische Nachrichten aus Steiermark (XVI/8): Bemerkenswerte Libellenfunde (Insecta, Odonata). Mitt. nat.-wiss. Ver. Steiermark 100: 450-453. – *(Goethestr. 28, A-8010 Graz)*.

A list is given of 10 faunistically new or interesting spp. found in Styria, Austria. New for the Styrian fauna are Coenagrion scitulum, Brachytron pratense, Cordulegaster boltoni charpentieri, Libellula fulva and Crocothemis erythraea. For each of the spp. listed a brief review of the Austrian localities and a note on the general distribution are added.

(123) STARK, W., 1971. Zur Auffindung der Grosslibelle Aeschna subarctica interlineata Ander 1944 in der Steiermark. Ent. NachrBl., Wien 23 (2): 65-67. – *(Goethestr. 28, A-8010 Graz)*.

The sp. was discovered at the peatbog Rotmoos (alt. 700 m approx.) nr. Weichselboden, Upper Styria, this being its only hitherto known locality in Styria, Austria. The only other spp. that occur at the same spot are Somatochlora arctica and Aeshna mixta. In the clashes between the 2 Aeshna spp., A. subarctica appears without exception the stronger. In one case precopula was observed between subarctica ♂ and mixta ♀. The plants recorded as oviposition sites are Sphagnum magellanicum, S. rubellum, S. cuspidatum and Cladopodiella fluitans.

(124) TAKASAKI, Y., 1971. Tramea virginia recognized in Shiojiri, Nagano Pref. Tombo 14 (1-2): 13. – *(c/o Society of Odonatology, Totsuka III-123, Shinjuku-ku, Tokyo, 160, JA)*.

A note in Japanese.

(125) TAKETO, A., 1971. Studies on the life history of Tanypteryx pryeri Selys (Odonata, Petaluridae). II. Habitat and habit of the nymph. Kontyu 39 (3): 299-310. (Japanese with Engl. s.). – *(Dept. Biochem., Medical School, Kanazawa Univ., Kanazawa, Ishikawa, JA)*.

Habitat selection, structure of burrows, feeding habits and other behavioural patterns of the larvae of T. pryeri were studied in the field near Kanazawa, Central Japan, and in the laboratory. Information is supplied on types of larval habitat, development of the burrow in the course of larval growth, daily activity of larvae, temperature influences, respiration ecology, preys, predators, locomotion, length of larval development and ecdysis behaviour. The sp. can be easily reared in the laboratory.

(125) TAKETO, A., 1971. The odonate-fauna of Ishikawa Prefecture. Rep. Ishikawa Ent. Soc. 3: 1-21 (Japanese with Engl. s.). – *(Dept. Biochem., Medical School, Kanazawa Univ., Kanazawa, Ishikawa, JA)*.

A detailed faunistic account is given on the 70 spp. recorded so far from the Ishikawa Prefecture, Central Japan. The zoogeographic and ecological aspects of the fauna are discussed.

(127) THEISCHINGER, G., 1971. Bemerkungen zu interessanten Libellenarten aus Oberösterreich. Naturk. Jb. Linz 1971: 17-20. – *(St. Margarethen 45, A-4020 Linz)*.

Revisional notes on the occurrence of Sympetrum depressiusculum (Sel.) in Austria are given. In addition, new Austrian records are presented for Somatochlora alpestris (Sel.), Aeshna juncea (L.), Anax imperator Leach, Cordulegaster boltoni boltoni (Don.), C. bidentatus bidentatus (Sel.) and Orthetrum cancellatum (L.).

(128) TROTTIER, R., 1971. Effect of temperature on the life-cycle of Anax junius (Odonata: Aeshnidae) in Canada. Can. Ent. 103: 1671-1683. – *(Research Station, Canada Dept. Agric., Vineland, Ont., CA)*.

Two distinct populations were found near Toronto, Canada: a larger summer (non-resident) population which developed from oviposition to emergence in approx. 3 months, (June to September); and a smaller overwintering (resident) population which overwintered as half-grown larvae and developed in approx. 11 months, from mid-July to the end of June of the next year. A threshold temperature of development of 8.7 ±0.1°C was determined in the laboratory for the development of ultimate instar larvae of the summer population. The rate of development of ultimate instar larvae, reared at constant temperature, was similar to that of the entire summer aquatic stages which developed in fluctuating temperature. An average of 1332 degree-days ±1% was required for development from the onset of oviposition to the onset of emergence of the summer population; whereas 20.5% more degree-days were required by the overwintering population, employing the threshold temperature of 8.7°C as determined for the summer population. It is recommended that the correlation between degree-day totals and duration of larval development be used in further studies as a means of understanding the migration pattern and the climatic limit of distribution for A. junius. (Author).

(129) UMEMOTO, S., 1971. (Emergence of Epiophlebia superstes). The Nature and Insects 6 (3): 12. Japanese. – (*Himeta, Yanai-shi, Yamaguchi Pref., JA*).
A brief record of the emergence.

(130) WATANABE, K., 1971. (Notes on Oligoaeschna pryeri). Gekkan Mushi 1 (2): 30-31. (Japanese). – (*3-10-2 Tsubaki-mori, Chiba-shi, Chiba Pref., JA*).
Observations on the adults and a literature citation of the bionomics are given.

(131) WHITE, III, H.B., 1971. New England dragonflies. Massachusetts Audubon 56: 8-14. (with 5 figs. by R.W. Buzzell). – (*Dept. Chemistry, Univ. Delaware, Newark, Delaware 19711, USA*).
A short popular paper on the Odon. of New England (U.S.A.), with descriptions of several more noticeable spp. A few notes on the history of dragonfly studies in the area are also included. (Author).

(132) WHITE, III, H.B. & R.A. RAFF, 1971. The nymph of Williamsonia lintneri (Hagen) (Odonata: Corduliidae). Psyche 77 (1970): 252-257. – (*Dept. Chemistry, Univ. Delaware, Newark, Delaware 19711, USA*).
The description and illustrations are based on an exuvia of a nymph emerged in captivity and on 12 others collected May 2-9, 1970 at Ponkapoag Bog, Blue Hills Reservation, Norfolk, Mass., USA. In general appearance the nymph somewhat resembles that of Dorocordulia lepida (Hagen); however, it is easily distinguished from that species and the nymphs of all other corduliid genera by the combined presence of dorsal hooks on abdominal segments 3-9 and lateral spines on abdominal segment 9 only.

(133) WILKES, F.G. & C.M. WEISS, 1971. The accumulation of DDT by the dragonfly nymph Tetragoneuria (Odonata). Trans. Am. Fish. Soc. 100: 222-236. (*Environmental Protection Agency, Div. Water Quality Res., Washington, D.C. 20460, U.S.A.*).
Ultimate instar larvae of Tetragoneuria spp. were exposed to subletal concentrations of uniformly labeled DDT-C_{14} dispersed in water. The activity of the DDT accumulated by the insects and of that in the exposure water was measured by the liquid scintillation counting technique. The accumulation of DDT from aqueous solution by both live and dead larvae as a function of DDT concentration and exposure time was determined. The DDT accumulation of the live larvae increased exponentially with increased concentration at a given exposure time. At a given concentration, accumulation also increased with increased exposure time. The DDT accumulation of the live insects greatly exceeded that of the dead larvae at the higher DDT concentrations studied. The results of this investigation indicate that both biological and physical mechanisms contribute to DDT uptake by dragonfly larvae and that rates of uptake by these mechanisms are concentration dependent.

(134) WILLIS, O.R., 1971. A mermithid nematode in naiads of damselflies (Odonata: Coenagrionidae). Fla. Ent. 54 (4): 321-324. – (*Ent. Res. Div., Agr. Res. Serv., US Dept. Agr., Ave. J. Chennault, Lake Charles, La. 70601, USA*).
A nematode, genus Amphimermis, sp. undescribed, was found parasitizing Ischnura posita (Hagen) and Anomalagrion hastatum (Say) in Louisiana, U.S.A., in frequencies up to 81% in samples. This is the second record

of mermithids in Odon. and the first in Zygoptera.

(135) YAMAMOTO, Y., 1971. (Cannibalism in Ceriagrion melanorum). The Nature and Insects 6 (10): 11. (Japanese). – *(Inafune Bldg., 1-2, Inafune-dori, Chigusa-ku, Nagoya, JA).*
The observation of a mature ♂ devouring a teneral ♀ of the same sp. is brought on record.

(136) ZENKIN, G.M. & I.N. PIGAREV, 1971. Visually conditioned activity in dragonfly neck-chain. Biofizika 16: 299-306. (Russian, with Engl. s.). – *(Inst. of Problems of Information Transformation, Acad. Sci. USSR, Aviatornaia 8a, Moscow, USSR).*
The activity of the neck fibres involved in the visual system of Odon. was studied by recording from the head and abdomen in 12 spp. of Lestidae, Gomphidae, Aeshnidae, Corduliidae and Libellulidae. Most of the fibres connected with the complex eyes react only to the movement of small objects with an angle-size 0.3-15.0°, they are completely unreactive to any other stimuli. With the complex eyes are connected also some fibres that react to stimuli of any size and contrast. The fibres responding to exclusion of light pass to the median and lateral ocelli. When the stimuli are moving, the median-ocellus fibres react mainly to upward movement of a horizontal band or boundary, while the fibres of the lateral ocellus respond only to downward movement. The possible functional significance of the fibres is discussed.